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Baltimore Region Water Quality Management Plan, Summary, November, 1979 Clean Enough for Fishing and Swimming

Regional Planning Council Baltimore, MD

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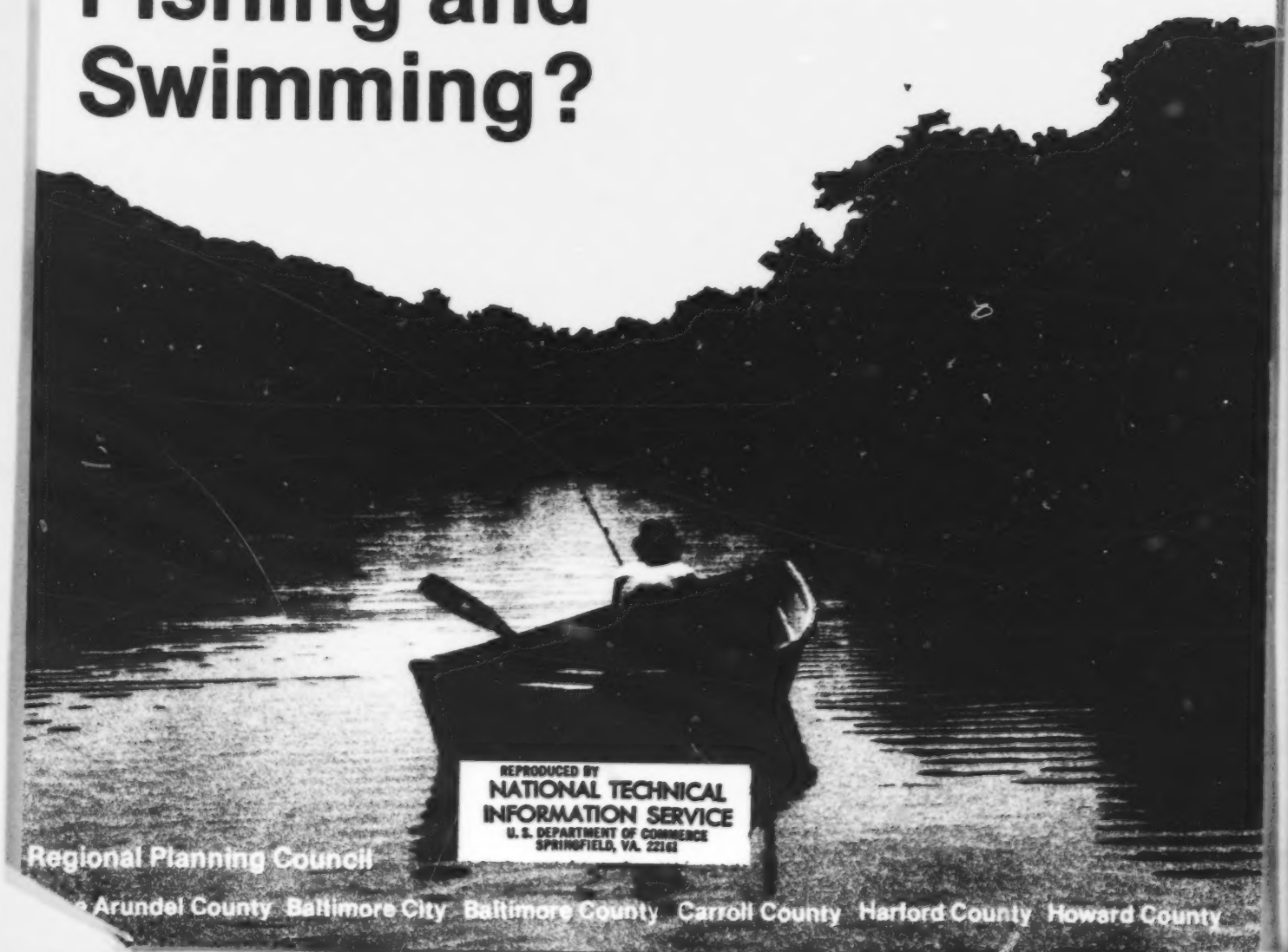
Baltimore Region Water Quality Management Plan

Summary
November, 1979

Clean Enough for Fishing and Swimming?



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This booklet summarizes the Water Quality Management Plan for the Baltimore Metropolitan Region. The Plan, published in 1978, details the water pollution problems in the region, and recommends actions to correct them, including cooperative agreements and legal arrangements among local governments. Water quality management plans were developed throughout the United States after the passage of the 1977 Clean Water Act, whose goals were to make water clean enough for fishing and swimming by 1983, and to eliminate pollution from industrial and municipal wastes by 1985. The summary includes many pictures, several maps and tables, and defines water quality planning terms as well as biological terms. It has been written for use by the general public.

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Water Quality Management Plan for the Baltimore Region

Summary

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REGIONAL PLANNING COUNCIL

BALTIMORE CITY ANNE ARUNDEL COUNTY
BALTIMORE COUNTY CARROLL COUNTY
HARFORD COUNTY HOWARD COUNTY

November 1979

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from the Chairman

Regional Planning Council
2225 North Charles Street Baltimore, Maryland 21218 (301) 383-5838
Milton H. Miller, Chairman C. Bowie Rose, Sr., Vice Chairman Walter J. Kowalczyk, Jr., Executive Director

September 20, 1979

Dear Citizen:

Our rivers, streams, lakes, estuaries, and groundwater supplies are vital to us. Their protection and improvement are in our own interest and in the interest of future generations.

The local governments of the Baltimore Region, long aware of the importance of our water resources and of their responsibility to preserve them, have been working in conjunction with state and federal agencies to identify water quality problems in the region and to find solutions to them. Then in 1975 the Governor designated the Regional Planning Council as the areawide agency to work with the region's local governments to prepare the areawide water quality management plan required by the U. S. Environmental Protection Agency in accordance with Section 208 of the Federal Water Pollution Control Act Amendments of 1972.

The technically detailed, voluminous Water Quality Management Plan for the Baltimore Metropolitan Region was completed in July 1978, adopted by the local governments, and conditionally certified by the Governor and the Environmental Protection Agency. The highlights of the plan are presented in this summary. We urge you to read it and welcome your comments. The complete plan is also available if you would like to refer to it.

The dedicated effort and cooperation on the part of the region's local elected officials, their staffs, and many interested citizens were of inestimable value in the preparation of the Water Quality Management Plan and will continue to be indispensable to its implementation. The Regional Planning Council expresses its appreciation to them all.

Sincerely yours,

Milton H. Miller
Chairman

from the Coordinating Committee

COORDINATING COMMITTEE
FOR
AREAWIDE WATER QUALITY MANAGEMENT PLANNING

September 21, 1979

Dear Citizen:

The quality of our water has a direct and powerful effect on the quality of our lives. We experience it when we drink a glass of water, swim, fish, use our boats, or use water for industrial and numerous other purposes.

The civilization when we enjoy threatens the quality of our waters with such pollutants as oils, sediments, industrial wastes, and bacteria. Local governments must deal directly with such problems because water flows across all governmental boundaries.

In 1975 the Governor designated the Regional Planning Council as the agency responsible to work with Baltimore City and Anne Arundel, Baltimore, Carroll, Harford, and Howard counties to develop cooperatively a plan for water quality in accordance with the Federal Clean Water Act.

This report summarizes the plan which has been prepared and adopted by these local governments. However, our work is not complete; preserving and improving water quality are not easy tasks. We are working now to refine the plan and, most importantly, to implement its key recommendations.

We are pleased to share the results of our work with you. We would appreciate having your comments on this report and, if you wish, on the more detailed plan which it summarizes.

Sincerely yours,

Walter S. Kowalczyk, Jr.
Secretary
Coordinating Committee

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The Goals of the Clean

Water Act...

"To eliminate discharges of pollutants into the nation's waters by 1985."

Introduction

In 1906 a police boat captain warned Baltimore City officials that the garbage and sewage dumped into the Baltimore Harbor was killing off the oyster population. There had been nearly four million square yards of oyster bars in the Baltimore Harbor. Now there are none.

High levels of water pollution have affected the whole region. Pollution has closed off some crabbing and oystering areas in Anne Arundel County and threatened swimming in portions of Harford County's Deer Creek. The Baltimore County Health Department was forced to close three bathing beaches, largely because of pollution from overflowing septic systems. The Little and Middle Patuxent Rivers in Howard County have been silting-in from construction site erosion, and Westminster's water supply in Carroll County has been threatened because of pollution running off into the Cranberry and Hull Creek branches of the Patapsco.

Across the nation, people see waterways being threatened and are speaking out in protest. In response to public outcry, Congress passed the 1972 amendments to former legislation designed to control water pollution. These amendments, which streamlined the old laws and mandated more definitive action, are known as the Clean Water Act.

The goals of the Clean Water Act are twofold: to make water clean enough for fishing and swimming by 1983; and to end the dumping of pollutants in the waters by 1985. This means that by 1983, water in places where people cannot safely swim now should be clean enough for swimming without endangering public health. It also means that wastewaters from industries, homes, and commercial areas must pass through treatment systems equipped well enough to remove harmful elements. It is an ambitious goal to meet. There have been improvements in water quality; one example is the Baltimore Harbor. But much work remains to be done.

Section 208 of the Clean Water Act charges all states in the nation to develop water quality management plans, granting them and 176 metropolitan areas $200 million to do so. The funds and the plans themselves are administered through the Environmental Protection Agency (EPA). In Maryland, the Water Resources Administration developed plans for all of Maryland except the Washington and Baltimore metropolitan areas, which were each designated to do their own 208 Plan. In 1975, the Regional Planning Council was designated by the Governor as the agency responsible for coordinating plan preparation for the Baltimore Region. Developing the Plan itself was a cooperative action by the Regional Planning Council and the six member jurisdictions: Baltimore City, and Anne Arundel, Baltimore, Carroll, Harford, and Howard counties.

For the most part, the men and women who will carry out the recommendations from the *Water Quality Management Plan for the Baltimore Metropolitan Region* are at the local government level. Working with their local government, the citizens of the City of Baltimore and the five surrounding counties will influence many decisions which affect the future health of the water in their area. This summary of the Baltimore Region 208 Plan has been prepared so that these decisions can be informed ones.

Ingredients of Water Quality Management

Planning for cleaner water and managing the clean-up effort involves a number of factors. All of these must be addressed in a water quality management plan if it is to succeed. One way to think of them is as "ingredients" of good water quality management. All of these ingredients are present in the *Water Quality Management Plan for the Baltimore Metropolitan Region* and are presented in this Plan Summary.

POPULATION AND LAND USE

Anticipated population distribution and land use are essential in planning, sizing,and scheduling new sewer lines and sewage treatment plants. As populations grow, so do the wasteloads of treatment plants, and the need for sewer extensions. Land use (i.e. industrial, agricultural, or residential) is linked to the quantities and types of pollutants which are likely to wash into the water in runoff. It is also considered when choosing methods of pollution control.

WATER QUALITY ASSESSMENT

In order to know how clean or polluted a body of water is, water quality program staff must sample and analyze the water and the creatures which live in it. This information is used to locate problems, to set priorities for corrective action and to measure progress in improving water quality.

POINT SOURCES OF POLLUTION

Point source pollution enters the water through easily identifiable points such as pipes or culverts. Because the major point sources of pollution are industries and sewage treatment plants, control or improvement of their discharges is crucial to water quality management.

NON-POINT SOURCES OF POLLUTION

Non-point sources include animal feedlots, croplands, urban streets, lawns and parking lots, construction sites, and a host of other scattered sources. Most non-point pollution washes into surface waters from land in stormwater runoff, though non-point problems may include groundwater contamination. The goal for management of non-point sources is to identify and locate them and develop and apply affordable measures of control.

RESIDUALS MANAGEMENT

Residuals, or leftovers, refers to two forms of waste: solid waste and sludge. Solid waste, the mixed scrap and garbage discarded by our society, is usually disposed of in landfills. This method of disposal presents potential dangers to water—either through pollution of surface waters or through rainwater percolating through the disposal site into groundwaters (leachate).

Sewer overloads are a point source of pollution which are especially active during wet weather.

Sludge, the solids left over from wastewater treatment, must be disposed of properly or used when possible so that it does not contaminate water.

IMPLEMENTATION AND MANAGEMENT

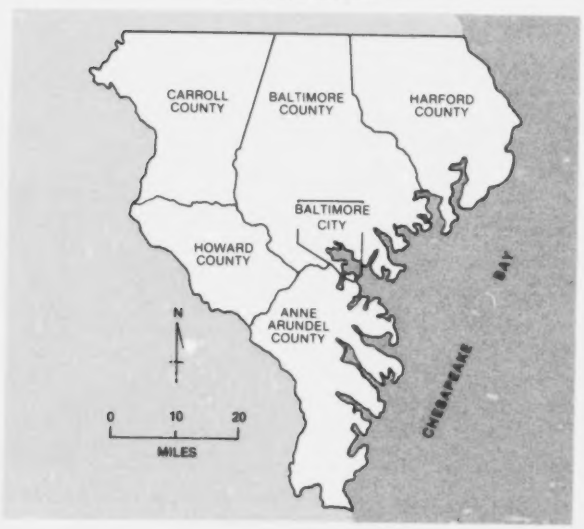
In a field as complex as water pollution control, many agencies at all levels of government each have responsibility for doing a part of the job. Evaluating the many existing programs, periodically reviewing the laws behind them, and recommending corrective actions as needed are essential to successful water quality management.

PUBLIC PARTICIPATION

Because the general public ultimately benefits from pollution control, and because it must also pay the costs, it is mandated by Federal law that citizens be involved in planning for clean water. Citizens also play valuable "monitoring" functions—by spotting pollution problems and by keeping an eye on the effectiveness of water quality programs. In this way, private citizens can be valuable partners with government agencies in making water clean enough for fishing and swimming.

The trash dumped on this hillside is a potential non-point source of pollution to the water below.

BALTIMORE REGION



The 208 Plan was prepared with elements addressing all of these ingredients. It was adopted by the local jurisdictions in June of 1978, conditionally certified by the Governor in September, 1978, and conditionally certified by the Environmental Protection Agency in March, 1979. The following pages explain what the 208 Plan says and what the Water Quality Management Program is now doing in each of these areas.

Population and Land Use

Changes in land use affect the wasteloads of sewage treatment plants and the type of pollutants which run off into surface waters.

The Federal Clean Water Act requires that any federally funded sewerage projects in the Baltimore Region be sized and staged so that future capacities meet the needs of populations predicted in the Baltimore Region's 208 Plan and costly excesses are avoided. These provisions give the Baltimore 208 Program a continuing, significant responsibility to keep population projections current and consistent in light of changing economic trends and local government policies. All future sewerage projects in the region must be consistent with the projections listed in the 208 Plan.

STUDY FINDINGS

Prior to the initial 208 planning effort, there were inconsistencies among the "populations served" predicted by the several jurisdictions which share the region's two largest treatment plants, Back River Wastewater Treatment Plant and Patapsco Wastewater Treatment Plant. Projections for some other service areas were too high or otherwise inconsistent with county-wide trends. Realizing the significance that would be given the numbers in the 208 Plan, local, regional and state planners developed a unified set of projections which eliminated these problems.

These projections were developed primarily by local staff, based on the land use plans adopted by their respective jurisdictions. In effect, the 208 Plan accepts the current land use plans of the City, the five counties, and their municipalities.

RECOMMENDATIONS

The plan contains population projections at three different levels of detail. It presents countywide totals for five year intervals between 1978-1988. It presents predicted total populations for small areas — either small watersheds or small sewer service areas — in each jurisdiction. And, it lists projections of total resident population and total population served for each complete sewer service area in the region. Table 1 gives population totals for 1978 and 1998.

TABLE I
TOTAL POPULATION FOR EACH JURISDICTION

	1978	1998	% of Increase
BALTIMORE CITY	832,700	875,600	5%
ANNE ARUNDEL COUNTY	374,700	574,100	53%
BALTIMORE COUNTY	664,600	894,100	35%
CARROLL COUNTY	89,000	129,000	45%
HARFORD COUNTY	144,000	205,800	43%
HOWARD COUNTY	122,000	256,200	110%
REGION TOTAL	**2,227,000**	**2,934,700**	**32%**

IMPLEMENTATION

Since the 208 Plan's certification in the fall of 1978, the figures in the plan have been used by State and Federal agencies as the criteria for reviewing and approving all proposed new sewerage plans and projects. Work on population projections will continue, particularly in Baltimore and Anne Arundel counties, which are developing new growth management plans and sewer facility plans.

Recognizing the need to eliminate inconsistencies between planning for air quality, water quality, transportation, and housing, a regional committee is now working to produce a unified set of population figures. The 208 population figures are a major contribution to this effort.

Water Quality Assessment

In an unpolluted stream, the dissolved oxygen level is almost always higher than six parts per million, an amount sufficient to support fish and other aquatic life.

WHAT IS CLEAN WATER?

In the simplest sense, it is water of sufficient quality to support a broad range of aquatic life. To make this possible, certain elements and compounds must be present as raw materials for growth and development. They are carbon, hydrogen, nitrogen, phosphorus and potassium. These building blocks of life not only must be present; they must also be in balance within very close tolerances. There should also be a nearly neutral pH, a moderate temperature, sufficient dissolved oxygen (which fish breathe) and a lack of toxic substances such as heavy metals or pesticides. For some life forms such as aquatic grass, sunlight must be able to penetrate the water.

Water pollution occurs when these conditions get out of balance. Listed below are some key factors which can disrupt a water quality eco-system.

Oxygen demanding materials—Examples of these are sewage, dead leaves and wastewater effluent. These organic compounds (carbon compounds) and some nitrogen compounds stimulate the growth of bacteria in the water which at the same time consume dissolved oxygen. This is measured as biochemical oxygen demand, or the amount of oxygen being taken out of the water. If the dissolved oxygen level drops too low (less than four parts per million parts of water) aquatic life forms such as fish and shellfish die quickly. This is often the cause of fish kills seen in the Chesapeake Bay and its tributaries each summer.

Toxic substances—These include some petroleum compounds and heavy metals. Toxics can produce disease or mutations in aquatic life. In sufficient quantities these chemicals can kill larvae and adults, wiping out entire populations. Concentrations of toxic substances in the bottom muds of the inner Baltimore Harbor have apparently contributed to the elimination of bottom dwelling (benthic) life forms there, such as oysters and clams.

Fecal Coliform—This type of bacteria which occurs in the waste of warmblooded animals (including humans), can indicate the presence of sewage in the water. Although they are not themselves carriers of disease, high coliform counts in water suggest the presence of other more harmful bacteria from waste, some of which can transmit disease. For example, portions of the Gunpowder River in Gunpowder State Park are experiencing high levels of bacteria because of discharges from Richlyn Manor Sewage Treatment Plant. High fecal coliform levels are a prominent problem throughout the Baltimore Region.

pH—This is a measure of the acidity or alkalinity of water. The pH level should be around seven or neutral, on a scale of fourteen. When it drops very low or increases significantly it can upset certain species. Industrial wastes and runoff from landfills can cause pH imbalance, though fluctuations may occur as a result of natural conditions.

Temperature—Another form of pollution is abnormally high temperature. The two main effects of temperature increases are a reduction of the water's ability to retain oxygen and killing temperature-sensitive species. In Whitemarsh Run, Baltimore County removal of trees and bushes which shaded the stream has led to harmful temperature increases.

Nutrients—The elements nitrogen, phosphorus and potassium (major ingredients of fertilizers) stimulate the growth of algal and rooted aquatic plants. This is desirable up to a point because these are sources of food for many fish. However, the excessive addition of nutrients (called overenrichment) can stimulate the overgrowth of plants. As these die off, they in turn create oxygen demand in the pond, reservoir or river, and serious dissolved oxygen drops can result.

Sediment—Particles of eroded soil that settle to the bottom of a body of water because of gravity form sediment. Sediments can clog the gills of fish, block sunlight from reaching aquatic plants, smother bottom dwelling life (such as shellfish), cause stream temperature increases, and transport nutrients and other pollutants into the water. Large amounts can fill in lakes, ponds, and estuaries, eliminating entire communities. Lake Roland in Baltimore City has been filling in with sediment. The lake, once used as a reservoir, has lost 75% of its volume to sedimentation since 1942.

Turbidity—A measure of the cloudiness of water, turbidity is often the result of excess sediments, though it can be caused by particles of organic matter. Turbidity blocks light from aquatic plants, preventing them from producing food and oxygen. Samples taken from the urban portion of the Jones Falls during storms frequently showed violations of turbidity standards.

Excessive nutrients stimulated the overgrowth of algae in this river. As the algae dies and decomposes it becomes oxygen demanding, and may cause a fish kill.

The Clean Water Act states that by 1983 all of the waters in the region must be clean enough for fishing and swimming. To reach the goals of the Federal Clean Water Act and Maryland law, the State Water Resources Administration has established quality standards. They address maintaining enough dissolved oxygen for fish to survive; a neutral pH; and keeping down the bacterial, turbidity, and temperature levels. The State has applied these standards to the water use classification which it has developed for the seven major river basins in the region (see Table 2).

TABLE 2—MARYLAND WATER CLASSIFICATIONS AND WATER QUALITY STANDARDS

Classification	Bacteria	Dissolved Oxygen	Temperature	pH	Turbidity
I Water Contact Recreation and Aquatic Life	Fecal coliform density cannot exceed a log mean of 200/100 ml. There shall be no public health hazard.	Daily average must be 5.0 mg/l or more; must be above 4.0 mg/l at all times, except where lower values occur naturally.	May not be elevated more than 5° F above natural levels. May not exceed 90° F outside of "mixing zones."*	Must be between 6.5 and 8.5, except where values outside this range occur naturally.	May not exceed levels harmful to aquatic life. Receiving waters may not exceed 150 Jackson Turbidity Units at anytime.
II Shellfish Harvesting	Most probable number (MPN) of all coliform organisms may not exceed 70/100 ml as a median.	Same as Class I	Elevations above natural shall be no more than 4° F (Sept.-May) and 1.5° F (June-Aug.) outside of "mixing zones."	Same as Class I	Same as Class I
III Natural Trout Waters (propagation)	Same as Class I	Must be above 5.0 mg/l at all times, except where lower values occur naturally.	No significant thermal discharges. May not exceed 68° F beyond "mixing zones."	Same as Class I	Same as Class I
IV Recreational Trout Waters (stocking)	Same as Class I	Same as Class I	May not exceed 75° F beyond "mixing zones."	Same as Class I	Same as Class I

Source: Maryland Regulation 08.05.04.03. For further details see Table 1-B-7 pp 45a-d of the October Revisions of the 208 Plan.

*Mixing zone—an area of a stream where a discharge into the stream mixes with the natural stream water.

The classification for each segment of the major river basins is shown on Map 2 on page ten. All of the waters in the region have been designated at least as Class I, water suitable for fishing, swimming and boating. This reflects the national goals set by the Clean Water Act.

FINDINGS

In its assessment of the water quality in the region, the 208 Program identified six major sources of pollution:

1. Wastewater treatment plant effluents (Point Source)
2. Industrial wastewater discharges (Point Source)
3. Septic system failures (Non-Point Source)
4. Agricultural runoff (Non-Point Source)
5. Urban stormwater runoff (Non-Point Source)
6. Sediment pollution (Non-Point Source)

These six sources are discussed further in the Point Source and Non-Point Source sections.

To obtain more detailed information about how clean or polluted the streams in the region actually were, the 208 Program undertook a one year sampling program in cooperation with the Water Resources Administration (Department of Natural Resources). Table 3 on page ten shows some of the worst areas, or areas where the State Standards for pH, temperature, dissolved oxygen, and fecal coliform bacteria were most often violated during the sampling period. The map on page ten shows where these stations were located.

RECOMMENDATIONS AND IMPLEMENTATION

The 208 Program recommends that monitoring be continued in the waters of the region to detect problems as they develop and document improvements as they occur.

The experience of regionwide monitoring has led to the development of smaller monitoring programs for more specific information. These special studies reveal much more about the short term problems of an area such as a reservoir or lake. Another advantage is that pollution control actions are more easily applied to a small area. Examples of smaller programs are the Howard County 208 Program's study of the Columbia lakes and the sampling done in Carroll County on Big and Little Pipe Creeks. Each of these studies recommends particular actions focused on solving the problems in that area.

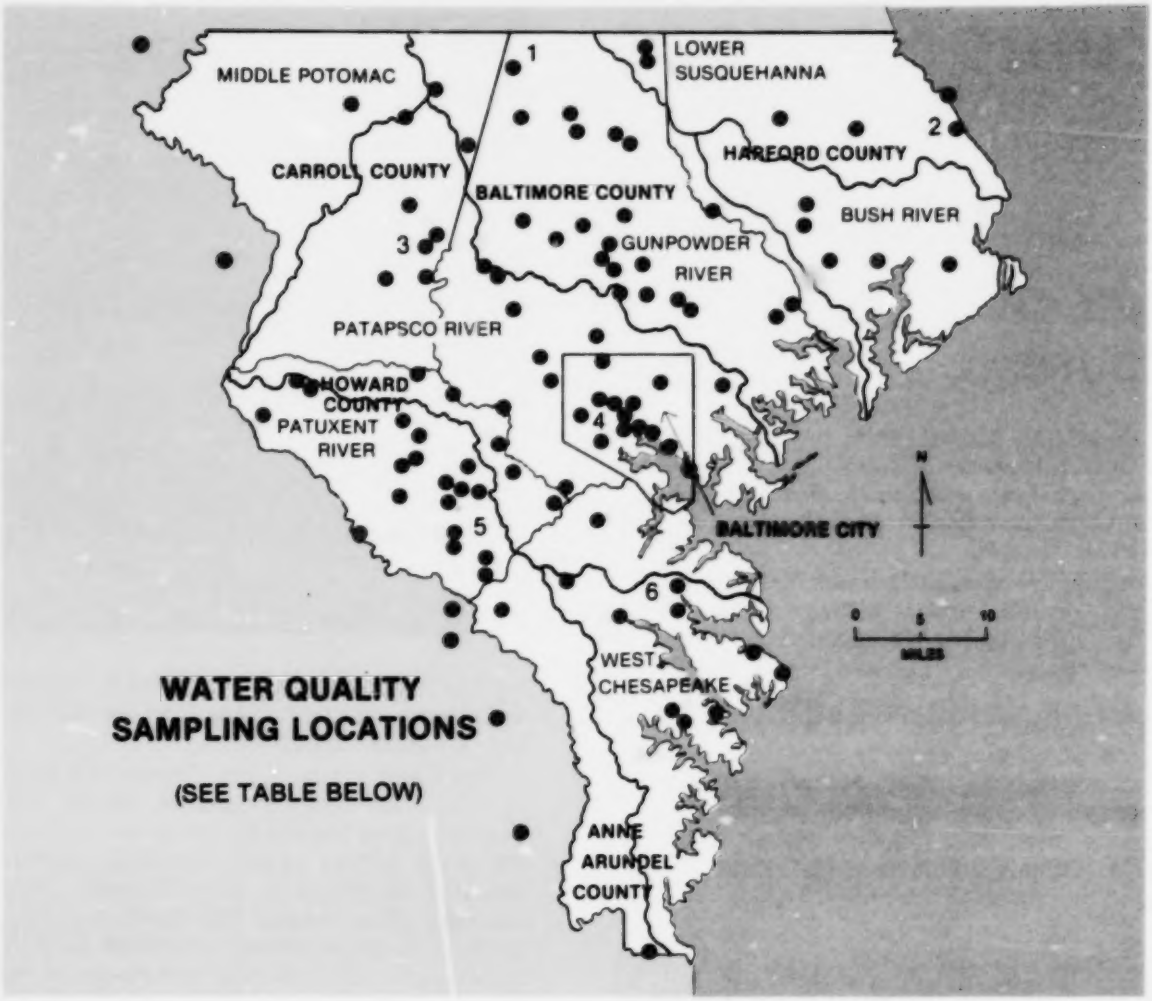


TABLE 3—SIX SAMPLING STATIONS THAT SHOWED THE MOST FREQUENT VIOLATIONS OF MARYLAND WATER QUALITY STANDARDS

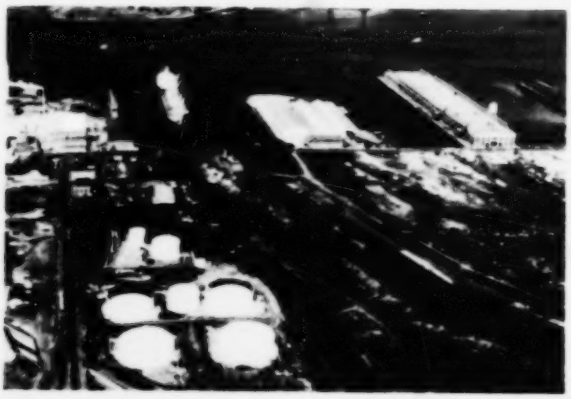
Map No.		pH	Temperature	Dissolved Oxygen	Turbidity	Bacteria
6	MAG 0084 Anne Arundel County Head of Magothy River at Maryland Route 648	8/11 = 73%	0/16 = 0%	0/16 = 0%	0/16 = 0%	1/1 = 100%
4	GWN 0022 Baltimore City Gwynns Falls at Brunswick Street	0/12 = 0%	0/24 = 0%	2/23 = 9%	0/15 = 0%	10/10 = 100%
1	GUN 0476 Baltimore County Gunpowder Falls at Gunpowder Rd. (head of Prettyboy Reservoir)	2/26 = 7%	8/34 = 23%	0/34 = 0%	0/34 = 0%	9/10 = 90%
3	BEA 0015 Carroll County Beaver Run at Md. Route 91	0/14 = 0%	3/25 = 12%	0/25 = 0%	0/25 = 0%	9/11 = 82%
2	DER 0015 Harford County Deer Creek near Stafford Road	2/20 = 10%	0/21 = 0%	0/21 = 0%	1/20 = 5%	2/2 = 100%
5	LXT 0200 Howard County Little Patuxent River at Route 32	2/23 = 9%	0/29 = 0%	0/29 = 0%	1/29 = 3%	6/6 = 100%

Point Sources of Pollution

Industrial Point Sources

Industries discharge their wastewater to surface water, to public sanitary sewers connected to sewage treatment plants, and under certain conditions, to selected groundwaters beneath the industrial site.

An industry dumping wastes directly into surface waters may discharge toxics, heavy metals, oil and other harmful substances or alter the water temperature. Industrial discharges to public sanitary sewers may contain chemicals which the sewage plant is not designed to treat: grease which may clog the treatment works or toxic substances which kill off the bacteria essential to plant operation. In the past, industries often used publicly owned treatment plants without adequately compensating the public for capital and treatment costs.



The Clean Water Act set up the National Pollutant Discharge Elimination System (NPDES) to regulate discharges from industries and sewage treatment plants. Each industry and treatment plant discharging to surface waters must obtain a discharge permit which specifies the limitations the wastewater must meet. These permits are issued and enforced in Maryland by the Water Resources Administration. They are based on state standards for clean water and on EPA's nationwide standards for industries. Each permit contains limitations for the specific pollutants known to be added during the company's use of the water, such as oil and grease, biochemical oxygen demand (BOD), pH, or suspended solids.*

The Clean Water Act addressed the problem of industries using treatment plants without compensating the public in two ways: by requiring each public sewer operating agency to establish an Industrial Cost Recovery Program whereby industries pay their fair share of capital costs; and by requiring industries to pretreat their wastewater prior to discharge to public sewers. During pretreatment, substances are removed which may pass untreated through a plant or which may upset plant operations.

STUDY FINDINGS

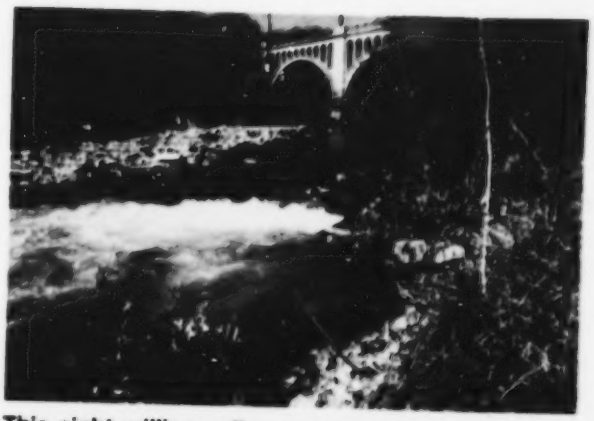
The 208 Program did not sample industrial discharges. The program obtained information on industrial discharges through on-going sampling programs conducted by the local governments and from the industries' own sampling reports which are required by the Water Resources Administration. With this information, the 208 staff developed a computer file containing all available information on industrial discharges, such as the amount and type of discharge and the pollutants it carries. This file is called the Industrial Discharge Information System and is described in the Plan. The 208 Plan also describes the present status of local industrial cost recovery and pretreatment programs in the region.

*Suspended Solids—small particles of solid pollutants in wastewater which resist separation by conventional means. Suspended solids contribute to turbidity.

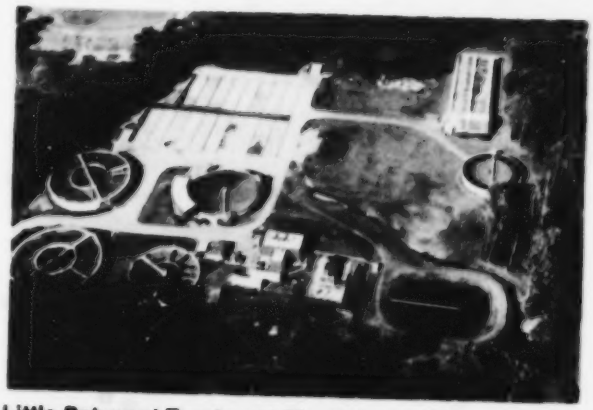
RECOMMENDATIONS AND IMPLEMENTATION

The task of controlling industrial pollution will be accomplished by the local governments through pretreatment and industrial cost recovery programs and by the Water Resources Administration through enforcing NPDES permits. An example of an industry improving its discharge is the Allied Chemical Corporation. Allied Chemical has altered its use of cooling water from the Baltimore Harbor so that the water will not have contact with chemical processes in the plant. The discharge now meets the NPDES permit limits set for the plant by the Water Resources Administration.

The Plan recommends that the 208 staff assist local governments in establishing Industrial Cost Recovery and pretreatment programs by providing them with information from the Industrial Discharge Information System file. Several jurisdictions have updated their information about industrial discharges in the Patapsco and Back River sewer service areas, and gathered more information about industrial discharges in the Liberty, Loch Raven, and Prettyboy reservoir watersheds. This information will be used as part of the 208 Program's Reservoir Protection Program. The Anne Arundel County 208 staff has used industrial information to locate industrial polluters for the County's industrial cost recovery program.



This eight million gallon per day sewer overflow on the Gwynns Falls was corrected through Baltimore City's use of Facilities Planning and Construction Grants.



Little Patuxent Treatment Plant Howard County — to serve a growing population, this plant will increase its treatment capacity from 10 to 15 million gallons per day by 1980. It will also move to higher levels of treatment and extend its discharge point below the drinking water intake of Ft. Meade.

Publicly Owned Point Sources

Because all publicly owned sewage treatment plants in the region discharge to surface waters, they are regulated by NPDES permits. As with industries, the permit limitations are custom-tailored for each situation. The size, flow and present condition of the receiving water and the expected quantity of treated sewage are all considered in developing effluent limitations. For a typical sewage treatment plant, the NPDES permit sets limits for biochemical oxygen demand, suspended solids, dissolved oxygen, fecal coliform bacteria, residual chlorine, and pH. Most sewage treatment plants in the region presently do not meet their permit limits. To do so, they need improvements which vary greatly in size and complexity.

Aerated lagoons at Hampstead treatment plant in Carroll County. This plant must expand its treatment capacity without increasing the discharge it sends into a tributary of Loch Raven Reservoir. Land application of sewage is being considered as an alternative.

Another section of the Clean Water Act provides federal grant assistance from EPA to help publicly owned sewage treatment plants upgrade and expand treatment facilities. Besides improvements for treatment plants, these "facilities plans" may include repairs for broken sewer pipes and failing septic systems. The Clean Water Act charges all facilities plans to consider alternatives to centralized sewage treatment (such as land treatment) when they attempt to solve the sewage problems of an area. The facilities planning program, administered in Maryland by the Environmental Health Administration, provides almost 90% of the cost of making improvements through EPA and State grants. A partner to the 208 Program, the Facilities Planning Program allows treatment plants to progress towards a goal of the Clean Water Act: to eliminate the dumping of pollutants into the water by 1985.

STUDY FINDINGS

Since most of the improvements to treatment plant discharges will come from the facilities planning effort, the Baltimore Region's 208 Program served mainly to document the progress of facilities planning in sewer service areas in the region and coordinate areawide planning, especially when two or more jurisdictions were involved.

The 208 Plan contains an inventory and discussion of all the region's current and proposed facilities plans. It also contains the effluent limits for all treatment plants in the region and a list of plants in order of priority for funding needed improvements. For each jurisdiction, there is an inventory of foreseeable sewerage needs, schedules and costs.

Other tables in the Plan present projections of flows, wasteloads, and populations served for each sewage plant. To ensure coordination between 208 planning and facilities planning, EPA regulations require that each facilities plan in the region be consistent with these projections in the 208 Plan, or grants for sewage treatment plant design and construction will be withheld.

The map on page 13 shows the areas in the region which are planning sewage system improvements such as upgrading treatment plants, sewer line extensions and repairs, and alternatives such as land treatment.

FLOW AND LOAD REDUCTION: RECOMMENDATIONS

Expansion of sewage treatment plants and installation of parallel (second) sewer lines is costly. One way to postpone such projects and to reduce operating costs is to reduce the generation of sewage and the unnecessary introduction of pollutants into wastewaters. The major water-consuming activities in the home are flushing the toilet and bathing. In Chapter Four, the 208 Plan discusses the opportunities for water conservation in the home through the use of water-saving toilets and shower-flow control devices. It calls for each sewer operating agency to develop an appropriate water conservation program. The Plan recommends against the use of garbage disposals, which add biochemical oxygen demand and suspended solids to sewage. It urges the use of low-phosphorus detergents (and smaller quantities of detergent) to reduce phosphorus levels in wastewater and thus help maintain nutrient balance.

ALTERNATIVE WASTE TREATMENT METHODS: RECOMMENDATIONS

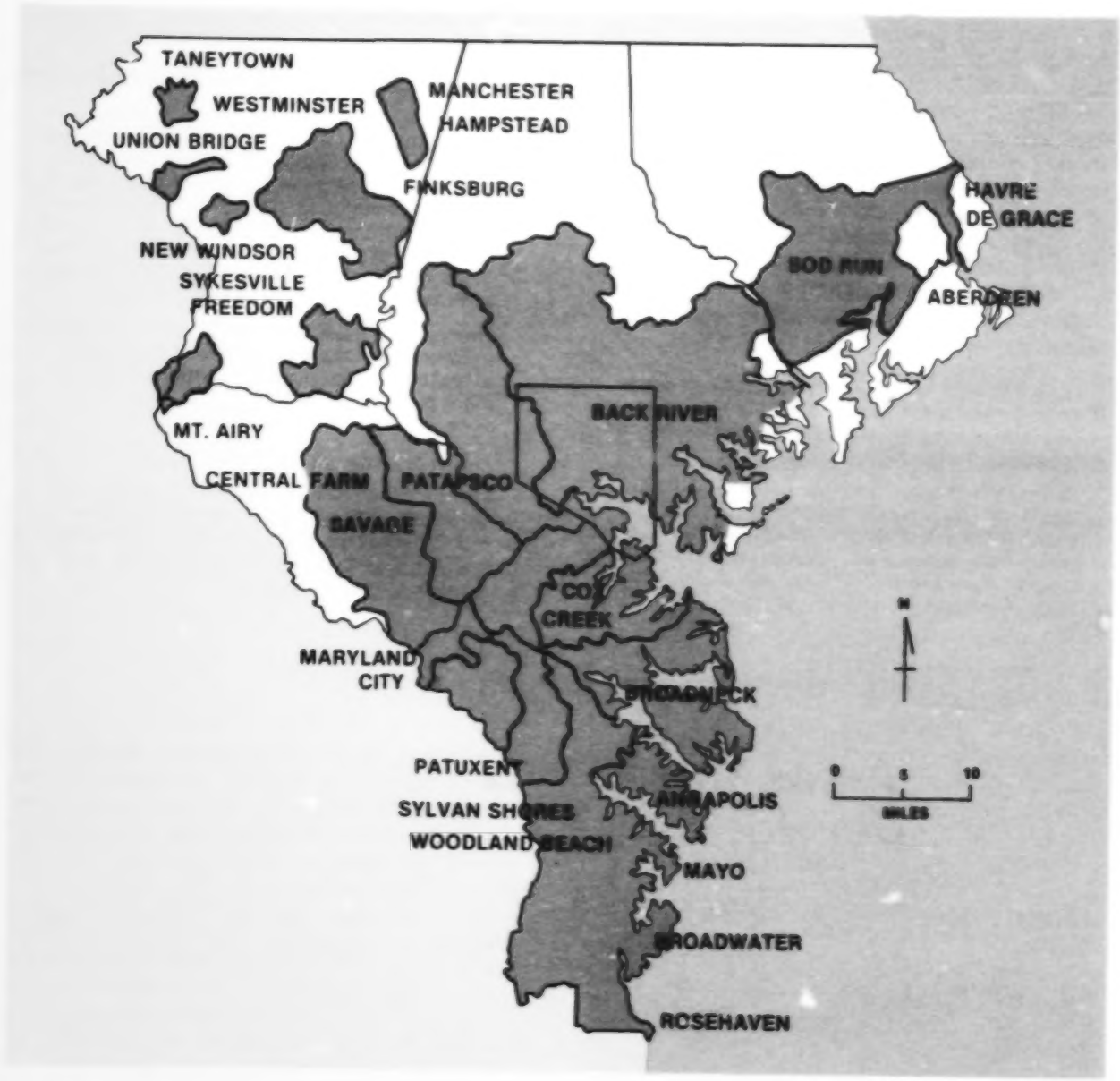
Many facilities plans in the Baltimore Region are examining solutions for septic system failures—especially where many failures are concentrated in one area, as on Middle River Neck in Baltimore County or on the Mayo Peninsula in Anne Arundel County. In the past, the conventional corrective measure was to extend public sewer service to those neighborhoods. The 208 Plan describes several on-site or neighborhood-scale alternatives which are presently being used and tested in many parts of the country. These small-scale systems are often cheaper to users and local governments than are central sewer hookups. Furthermore, they are less growth-inducing than extensions of sewer service to outlying areas. The 208 Plan urges the consideration of such alternatives wherever possible when sewage facilities planners look at septic problem areas.

IMPROVED SEWAGE TREATMENT VERSUS CONTROLLING RUNOFF: RECOMMENDATIONS

In a given watershed, improvements in water quality may be more easily achieved by controlling runoff from non-point sources than by going to higher levels of sewage treatment. The 208 Plan recommends that each facilities plan in the region which is considering advanced waste treatment compare the cost of non-point source controls with the cost of advanced waste treatment.

Expansion or extension of sewage facilities may open up an area to development which was previously rural. Increased construction, homes, and development in an area can increase levels of non-point pollution. These are the reasons development is controlled around reservoir areas. The 208 Plan calls for an evaluation of such "secondary impacts" in each facilities plan which recommends new sewer lines or treatment plant expansions.

FACILITY PLANNING AREAS



Introduction to Non-Point Sources

A non-point source of pollution can be an overfertilized suburban lawn, a newly plowed field, or a trash-ridden alley. Non-point sources of pollution come from different types of land uses and activities such as high density urban areas, agricultural land, mining, logging operations, construction sites, landfills, and failing septic systems. Pollution from these man-made activities (and from animal waste) washes into streams and rivers with the natural action of rain or melting snow. This action is called runoff.

Some major pollutants which come from these land uses are:

Nutrients—Nitrogen and phosphorus can come from domestic pet waste, fertilizers from lawns or cropland, and manure piles on pastures and feedlots.

Sediment—Erosion and the resulting sedimentation of streams are natural processes, but they can be harmfully accelerated by man's activities. In colonial days, Joppatowne in Harford County was a busy port on the Gunpowder River. This area is now too shallow for ships.

Ships once also sailed all the way up the Patapsco River to Elkridge, where there are now only a few feet of water. This filling in of rivers is called sedimentation. It is estimated that nearly one million tons of sediment are washed into the waters of the region yearly. Though this calculation excludes Baltimore City, it is enough sediment to fill nearly 20,000 freight cars.

Pesticides—These can wash into the water from cropland and neighborhood gardens. Toxic chemicals from pesticides often cling to sediment particles.

The following summary of non-point source pollution will discuss only urban areas, agricultural areas, and areas under development as non-point sources. These are the areas on which the Baltimore Region's 208 Program concentrated most of its attention.

Areas Under Development

Erosion from this construction site is washing down into the Jones Falls (not shown in picture).

Building new homes, roads, utilities, and shopping centers involves removing the trees and grass which anchor the soil from erosion. Heavy winds and rains can wash away soil from an uneven, exposed site, depositing it as sediment to clog nearby rivers and streams.

On Earth Day, April 22, 1970, the Maryland Sediment Control Law was passed, requiring each county in the State to have Soil Conservation District approval of all sediment control plans before building or grading permits can be issued. The law also placed responsibility for statewide leadership on the Department of Natural Resources. Working with the Soil Conservation Service and Soil Conservation Districts, the Department of Natural Resources developed a guide for sediment and erosion control in developing areas. The basis of the guide are Best Management Practices, measures designed to cut down on erosion and protect nearby rivers and streams from sedimentation.

Best Management Practices for construction sites follow basic principles. There are structures such as dikes which divert rainwater from the site; coverings such as straw mulch or grass which stabilize the soil; and barriers such as sediment traps and basins which trap water flowing from the site allowing sediments to settle out and cleaner water to flow from the site.

A sediment basin on a construction site. Sediment laden water is temporarily trapped, the particles settle to the bottom and cleaner water flows out of the basin.

STUDY FINDINGS

The work of the Soil Conservation Service, documented in *The Erosion and Sediment Study of the Baltimore Regional Planning Council Area*, revealed that construction sites have the highest rate of gross erosion of all land uses evaluated. Average soil losses of 114 tons per acre per year have been estimated for the region. Although the silt that washes away can be trapped by controls such as sediment basins or by any grassed areas that might be left on the site, much sediment actually escapes. Developing lands, which constitute less than 1% of the land area in the region, contribute 11% of the sediments which clog the streams and rivers each year. The 208 Program staff found that if sediment basins with a 70% trapping efficiency were used on all construction sites, the annual 114 tons per acre average soil loss could be reduced to 34 tons per acre per year. The results of this study are summarized in Chapter Three of the 208 Plan.

The Plan also includes a description of construction activity in the region, an evaluation of Best Management Practice effectiveness, and a description of local sediment and erosion control programs operating in the region. According to the non-point source inventories performed by local 208 staff in each area, violations of sediment and erosion control ordinances and lack of enforcement have been problems in each jurisdiction.

Participants in the sediment control program effectiveness evaluation in Baltimore County discuss practices to be used on the construction site in the rear.

RECOMMENDATIONS

To lessen the extent of non-point source pollution from construction, the 208 Program recommends:

1. That sediment basins or other control measures with high potential trapping efficiencies be considered for use on all construction sites.
2. That rigid enforcement of existing sediment control and/or building code regulations be maintained at all construction sites throughout the period of construction.
3. That the counties, cities, and towns in the region monitor the effectiveness of sediment control plans for construction sites. The purpose of monitoring is to ensure that soil conservation districts and local governments are accomplishing their mutual objectives with minimum expenditures of manpower and funds.
4. That the Water Resources Administration, Department of Natural Resources continually monitor, evaluate, and report on the progress of sediment and erosion control programs in the region. Violations of state and local regulations and codes should immediately be brought to the attention of local governments and soil conservation districts.
5. When funds for enforcement are limited, emphasis should be given to the critical erosion and sediment yield areas identified in the 208 Plan.

IMPLEMENTATION

During 1978-79, in keeping with the recommendations, above, 208 planners and engineers conducted a close review of local sediment control programs by visiting construction sites. They accompanied representatives of the State in their triennial review of sediment control in the jurisdictions which are part of the Baltimore Region.

To fully benefit from the review, 208 planners developed an evaluation process which would enable them to assess the program objectively as well as pinpoint the particular problems in each jurisdiction. In each county and the City of Baltimore, county, State and Federal agency representatives, elected officials, Homebuilder Association representatives, and members of the public paid unannounced visits to a number of randomly selected construction sites. The construction involved housing developments, industrial sites, utilities, and other non-agricultural land uses. The representatives used checklists for uniform comment on the conditions at each site and then participated in a discussion about the control program's effectiveness.

Agricultural Areas

Since the great dust storms that ravaged so much of the nation's farmlands during the 1930's, the local Soil Conservation Districts have been advising farmers about practices which save their rich topsoil from erosion. With the passage of the Clean Water Act, the Districts, which were primarily concerned with land conservation, also have national goals for clean water. Increasingly, non-point sources of pollution will be targets for corrective action.

The contributions of agricultural lands to non-point source pollution include sediments from eroding farmlands; nutrients from animal waste, or fertilizers applied to cropland and pasturelands; and chemicals from pesticides. All of these can wash into streams with rain or melting snow.

STUDY FINDINGS

To estimate the severity of the sediment problem, the Soil Conservation Service conducted an erosion and sediment survey for each area in the region except Baltimore City. This study, *The Erosion and Sediment Survey of the Baltimore Regional Planning Council Area,* found that cultivated agricultural land contributed 50% of the nearly one million tons of sediment that wash into the region's waters yearly. The study also found that conservation plans used on only 32% of the total farmland reduced soil losses on that land by 80%.

The *Small Homogeneous Watershed Study* conducted by 208 staff involved sampling farms in Baltimore, Carroll, and Howard counties believed typical of Piedmont agricultural land use and management. High levels of pollutants such as excess phosphorus, nitrogen, bacteria, and suspended solids were found in streams originating on the cropland, pastureland and barnlots of a dairy farm site. The staff conducted a random survey comparing the sampled dairy farm's animal waste management practices with those on other dairy farms. They found that there were similar or worse animal waste management practices on 60% of the dairy farms in the region.

Sampling at two Howard County farms revealed neither runoff nor pollutants. One site was a minimum tillage, continuous corn planting area, and the other was mixed cropland on which contour tillage and crop rotations were used. The staff partially attributed the lack of pollutants in the runoff to the good conservation practices on both farms.

Best Management Practices such as contour strip cropping can help prevent soil erosion and sediment pollution.

RECOMMENDATIONS

The 208 Program staff concluded that the best way to tackle the problem of agricultural pollution is to adopt the statewide agricultural program developed by the State Soil Conservation Committee, which was assisted by the Resource Conservationist assigned to the Regional Planning Council. The State Soil Conservation Committee's program was a coordinated effort by working farmers, representatives from State Soil Conservation Districts, and from the Maryland Water Resources Administration, the Regional Planning Council, Soil Conservation Service, University of Maryland, and other groups.

Highlights of the program are:

1. A focus on sediment and animal waste as potential pollutants. Nutrients and pesticides will be integrated into the program after more information about them is gathered.
2. The local Soil Conservation Districts will carry out the program with farmers. The Districts and the State Soil Conservation Committee will select within each District the potentially worst areas, or "critical areas", for sediment and animal waste pollution.
3. The Districts will carry out an educational program in selected critical areas. The program will assist landowners in recognizing conditions which might be contributing to sediment or animal waste pollution.
4. Farmers on whose land there are critical conditions will be encouraged to participate voluntarily. They will develop and implement a soil conservation and water quality plan, based on using Best Management Practices. The Districts will provide technical assistance and cost sharing wherever necessary and available.

Sediment running off a wheatfield.

IMPLEMENTATION

Some work which is part of the Statewide Agricultural Program has already been completed. The State Soil Conservation Committee has identified critical areas where the problems for sedimentation and animal waste are the worst from a statewide perspective. In identifying these critical areas, the State Soil Conservation Committee used the inventory of the numbers and types of animals in each watershed which was prepared by locally operated 208 technical advisory committees. Each of the local Soil Conservation Districts is now identifying similar areas in each District where sediment and animal waste-related pollution problems are critical.

After identifying the local critical areas, the Districts will work with the farmers on a voluntary basis to develop and implement Soil Conservation and Water Quality Plans for critical areas with the highest priority.

An important part of 208 planning is identifying Best Management Practices. These are based on tried and proven conservation practices which reduce the amount of pollution from non-point sources. They are usually more effective when used in combination rather than alone. Contour plowing and planting cut down on erosion in sloping cropland. Minimum or no-till farming which uses crop residues lessens both runoff and the transport of nutrients and pesticides which cling to sediment particles. The 208 staff surveyed conservation practices in the region and developed a listing of the applicable management practices, where they could be applied, the pollution problems they affect, and the costs of using them. From that list and discussions with agricultural representatives, those practices believed to be the most beneficial for controlling non-point source pollutants in agricultural runoff were identified. Specific practices for cropland, pastureland, hayland, barnlots, and woodland were designated as Best Management Practices.

Urban Non-Point Source Areas

Cleaning out trash from storm drains — this urban housekeeping practice prevents trash from entering surface waters in storm runoff.

In urban areas, the concentration of industries, shopping centers, businesses and homes combine with the vast extent of paved surfaces to create a great potential for water pollution from runoff. During a rain storm, stormwater runoff can wash dirt, oil, grease, animal waste, and other materials from streets, alleys, rooftops, industrial sites, and commercial areas. In highly developed, paved-over areas, the opportunity is lost for stormwater to be naturally purified by filtering through soil or vegetation. Instead, it becomes increasingly polluted, flowing into storm drains which can empty directly into rivers, lakes, and streams. Besides carrying pollutants, runoff from the paved surfaces increases in amount and velocity, creating problems such as streambank erosion and highly fluctuating streamflows. All these are harmful to the health of most aquatic organisms.

STUDY FINDINGS

The non-point source inventories and stream surveys completed during the initial planning phase identified sources of pollution in urban areas. They also documented existing urban management practices such as street sweeping and catch basin cleaning. Though they affect water quality, these practices are generally carried out with the intent of improving the appearance of the street rather than cutting down on water pollution.

As part of the *Small Homogeneous Watershed Study* conducted by 208 staff water quality sampling was done in suburban, medium, and high density residential areas. The study documented widespread problems such as high bacteria levels in urban streams and rivers. The fact that bacteria levels frequently exceed the State water quality standards (see Water Quality Assessment Section) during both dry and wet weather is attributed partially to overflowing sanitary sewers. During wet weather when streamflows are higher, there were also frequent violations of the turbidity standards.

RECOMMENDATIONS

Though the sampling program revealed very little about the effectiveness of urban management practices in curtailing pollution from runoff, it did uncover certain deficiencies in the practices and developed recommendations aimed at improving them. However, implementation of many of the recommendations may follow the completion of a proposed three-year study of urban stormwater pollution in the Jones Falls. The study, part of a national urban runoff demonstration program, will be partially sponsored by EPA and the local governments. The information gained from the study will support the further development of practices which control urban runoff pollution. The following are the major recommendations from the 208 Plan for improving "urban housekeeping" practices:

1. Develop a strong public information and education program about the proper use of residential lawn fertilizers.
2. Study the pollutant removal effectiveness and cost of existing street sweeping practices.
3. Establish regular maintenance programs for catch basins, emphasizing basins which are most likely to have the greatest effect on water quality. Evaluate the pollutant removal effectiveness of the existing catch basins and maintenance programs.
4. Evaluate and develop a comprehensive regional study of stormwater management practices which are oriented towards improving water quality.
5. Evaluate the effectiveness of urban pet waste disposal practices.

IMPLEMENTATION

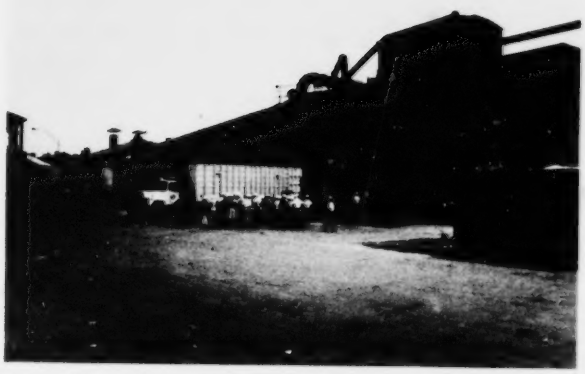
1. The staff has developed a work program for the Jones Falls Urban Stormwater Runoff Study to evaluate urban problems and possible solutions.
2. The six local governments have begun comprehensive reviews of their stormwater management programs with the intention of later recommending changes in existing programs. These changes will focus on water quality considerations.
3. The 208 staff developed a report examining pet waste as a potential water quality problem. It presents nationally tested methods which could be applied to the problem in the Baltimore area.

Urban stormwater runoff contributes to pollution problems in the Jones Falls.

Residuals

Sanitary landfills handling solid waste materials in the Baltimore Region are operated by private companies as well as local governments. Refuse collection is handled by a variety of methods, including municipal or county contracts, municipal services, and private contractors or haulers. Refuse disposal must be at a facility pemitted by the Maryland State Department of Health and Mental Hygiene and, in some cases, by the local jurisdictions.

The Solid Waste Division of the Department of Health and Mental Hygiene schedules routine and background water quality sampling at disposal sites. In addition, some local governments maintain their own monitoring programs. The primary purpose for monitoring is to serve as a check on potential leachate* contamination. It has led to the identification of water quality problems on both operating and closed landfills.



Recycling solid waste — citizens and various agency staff inspect the Baltimore County Resource Recovery plant, where refuse is compacted into solid fuel pellets.

Two authorized hazardous waste facilities are in operation: one owned by the Browning-Ferris Industries in Anne Arundel County, and a facility operated by the Maryland Port Administration at Hawkins Point in Baltimore City. Certain other solid waste disposal facilities in the region have applied for hazardous waste designation.

Table 4 lists estimates of the total amounts of solid waste handled by landfills in each jurisdiction.

TABLE 4: LANDFILLS BY JURISDICTIONS

Jurisdiction	Private		Public	
	Number	Tons/Day	Number	Tons/Day
ANNE ARUNDEL COUNTY	2	850	5	1053
BALTIMORE CITY	7	500	12	2600
BALTIMORE COUNTY	1	1500	3	593
CARROLL COUNTY		0	3	381
HARFORD COUNTY	1	275	2	145
HOWARD COUNTY		0	1	348
Regional Total	11	3125	26	5120
Total tons of solid waste handled by private and public landfills each day.				8245

*Leachate—Liquid that has percolated through solid waste or other materials and extracted dissolved or suspended materials from it. These materials may contain bacteria, oxygen demanding materials, nutrients, salts, heavy metals and other potentially hazardous materials that can affect water quality.

There are several on-going efforts in the Baltimore Region to recycle solid waste into energy. The Pyrolysis Plant in Baltimore City converts refuse into steam, and the Resource Recovery Plant in Baltimore County produces cigar-size fuel pellets which can be burned like coal.

Maryland law requires that each jurisdiction be responsible for preparing a comprehensive plan to manage solid waste for at least a ten-year period. The types and quantities of wastes and the methods for their disposal or use must be accounted for in these plans, prepared under the guidelines of the Department of Health and Mental Hygiene. While the plans themselves do not address water quality directly, they include consideration of any applicable water pollution laws.

Sludges, the solids removed from sewage and industrial wastewater during treatment, can adversely affect water quality because they contain heavy metals, nutrients, oxygen demanding materials, and disease carrying bacteria. Sludge disposal is regulated by the Department of Health and Mental Hygiene. All disposal sites must have permits from the State, and the amount and frequency of application is based on analysis of the sludge content and soil type. The permits set limits on disposal to prevent the uptake of heavy metals from sludge by plants (which will introduce them into the food chain). To minimize adverse effects on water quality, the permits also take into account how the sludge is mixed with the soil, the depth to groundwater, and distance from the nearest stream or river.

There are a variety of methods for sludge disposal and use currently employed in the region (see Table 5). The Environmental Protection Agency is emphasizing beneficial uses of sludges rather than simply trucking them to a landfill. Alternatives such as applying them as soil conditioners will be explored in preparing facilities plans for sewage treatment plants (see Point Source Section). All facilities plans prepared by local jurisdictions and the State are required by EPA to examine alternatives for sludge disposal. Table 5 gives examples of 1978 sludge generation rates, uses, and methods of disposal for the Baltimore Region.

TABLE 5
SLUDGE GENERATION RATES AND METHODS USED/1978

Jurisdiction	DRYING BEDS/ AG. APPLICAT.	DRYING BEDS/ LANDFILL	LANDFILL/AG. APPLICATION	DEWATERED/AG APPLICATION	DEWATERED/ LANDFILL	DEWATERED/ INCINERATION	HEAT TREATED/ AG. APPLICAT.	RECLAMATION	Dry Tons/Year
Anne Arundel County	X	X	X	X		X	X	X	5,306.6
Baltimore City					X			X	22,995.0
Baltimore County[1]	Not Applicable								Included with above
Carroll County	X	X	X	X	X			X	866.0
Harford County		X	X					X	1,881.8
Howard County				X				X	2,190.0

[1] Baltimore County data is included with Baltimore City

STUDY FINDINGS AND RECOMMENDATION

During the initial two year planning effort, the Baltimore 208 Program did not place major emphasis on solid waste and sludge management. The Plan contains a report which describes proper sanitary landfill design and operation, and existing and projected sludge generation rates for the region. It recommends that future landfill monitoring programs provide more information about each landfill's effects on water quality.

IMPLEMENTATION

Since the release of the plan, the 208 staffs in the local jurisdictions have compiled a comprehensive report, "Residuals Management in the Baltimore Region." It includes a review of landfills in each jurisdiction, reports water pollution from certain landfills, and describes hazardous waste facilities operating in the region. The second half of the report describes sludge management: the methods of sludge disposal and current sludge generation rates in the region. The information in the table above was taken from this report.

As a follow up to the residuals report, the Baltimore Region 208 Program will address the integration of water quality management concepts into state and local residuals management programs.

Implementation and Management

Protecting the reservoirs from pollution requires cooperative agreements among several jurisdictions.

Implementing a plan for a large metropolitan area which examines such diverse pollution problems as industrial wastes and pasture runoff requires sound management structures and sufficient legal authority. The 208 Program is the only national water quality program which has the statutory authority to evaluate the performance of existing local, regional, and state water quality management programs. It also has the authority to require needed improvements.

Local government cooperation was built into the 208 Program from the outset by giving local governments maximum voice in planning the programs which they would eventually carry out. Nearly two-thirds of the grant money awarded by EPA to the Regional Planning Council was passed on to the local governments and used for hiring 208 staff in the five counties and the City of Baltimore. The local staffs conducted studies and developed recommendations for pollution problems in their areas, while the Regional Planning Council 208 staff coordinated local efforts to develop an areawide plan.

STUDY FINDINGS

During the two-year initial planning phase, local and State officials in the Baltimore Region were interviewed to uncover problems in their programs. Though the review of management programs involved examining alternatives to existing water quality programs the reviewers concluded that existing programs in the region were capable of carrying out the new tasks emerging from the areawide water quality plan. The legal analysis found that local, regional, and State agencies in the Baltimore Region had the legal authority to operate an areawide water quality management program.

RECOMMENDATIONS AND IMPLEMENTATION

There were several types of management actions required to set up and run the areawide water quality program in the Baltimore Region. Each county and the City of Baltimore needed to be designated as a water quality management agency in order for them to implement the 208 Plan in their local area and to receive federal grants for wastewater treatment improvements. Out of these, certain departments such as the Baltimore County Health Department, were chosen as the "lead agency" to coordinate water quality planning in the county. The City of Annapolis and several towns in Carroll and Harford counties had to be designated as wastewater management agencies, so that they could be eligible for Facilities Planning grants. Also, responsibilities for agricultural pollution control needed to be delegated.

Some issues, such as pollution in reservoirs and operation of Back River and Patapsco sewage treatment plants, involved several jurisdictions and required new cooperative agreements among them. All of these recommendations and the review of legal authority and management agencies are summarized in Chapter 8 of the 208 Plan.

MANAGEMENT AGENCIES DESIGNATED

AGENCY	FUNCTION
Water Quality Management Agencies: Baltimore City and Anne Arundel, Baltimore, Carroll, Harford, and Howard counties	These local governments are responsible for implementing the 208 Plan in their area. They are also eligible for EPA Facilities Planning and Construction grants for wastewater treatment. One department in each area will function as a "lead agency."
Municipal Wastewater Management Agencies: Annapolis; Hampstead, Manchester, Mt. Airy, New Windsor, Sykesville, Taneytown, Union Bridge, and Westminster (all in Carroll County); Aberdeen, Bel Air, and Havre de Grace (Harford County)	These cities and towns are eligible for EPA Facilities Planning and Construction grants for wastewater treatment.
Areawide Planning Agency: The Regional Planning Council	Coordinates continuing 208 planning in cooperation with the local governments
Agricultural Program Five Soil Conservation Districts: Anne Arundel, Baltimore, Carroll, Harford and Howard counties	The districts are responsible for sediment and erosion control. This includes erosion from construction sites, agricultural lands, surface mining and forestry operations. They are also responsible for stormwater management planning.

Control of pollution from agriculture should continue to be handled by the Soil Conservation Districts, which work with farmers on a voluntary basis. The Maryland Water Resources Administration (WRA) will investigate reported violations. Persons cited by WRA will be told that they may ask for help from the local Soil Conservation Districts to correct the problem. Local Districts will be coordinated by the State Soil Conservation Committee.

Five State agencies—the Environmental Health Administration, Department of Health and Mental Hygiene; Maryland Environmental Service, Water Resources Administration, Department of Natural Resources; State Soil Conservation Committee, Department of Agriculture; and the Maryland Department of General Services—are all designated to continue specific responsibilities.

COOPERATIVE AGREEMENTS

AGENCY	FUNCTION
Reservoir Protection: Baltimore City, Baltimore County, and Carroll County will sign a cooperative agreement.	The Reservoir Protection Program is designed to minimize pollution draining into Loch Raven, Prettyboy and Liberty Reservoirs.
Wastewater Analyzer Office: The Plan invites Anne Arundel, Baltimore, Carroll, and Howard counties to participate with Baltimore City in this project. Baltimore City and Baltimore County are now staffing this office; Anne Arundel and Howard counties are now providing data and representatives at meetings; and Carroll County is sending an observer.	The Wastewater Analyzer Office was established to analyze existing and future flows to Back River and Patapsco wastewater treatment systems. The office also makes recommendations to correct problems such as sewer overflows and infiltration of groundwater into sewer lines.

IMPLEMENTATION: CONTINUING ACTIONS

Water Quality Planning and Management Agencies:

The Regional Planning Council is continuing to coordinate 208 planning for the Baltimore Region.

In several jurisdictions, the local 208 "lead agency" is working with other local regulatory and operating agencies to identify problems in existing programs, policies or procedures. Improvements are being implemented where feasible.

Several jurisdictions are providing budgetary support to permanent local water quality management offices.

Agricultural Pollution Control:

The Agricultural Pollution Control Program has been adopted by the State and is now being implemented. One immediate result is that farmers in several jurisdictions will be eligible for funds authorized under the U.S. Rural Clean Water Act, as they are made available by Congress and the U.S. Department of Agriculture.

Reservoir Protection:

The "Reservoir Protection Agreement" has been signed by Baltimore City and is now under consideration by Baltimore and Carroll counties (August 24, 1979).

Wastewater Analyzer Office:

The Wastewater Analyzer Office has received funding under the Facilities Planning Program to share information and monitor sewage flows for the Back River and Patapsco treatment plants. Baltimore City has taken the first steps in setting up the office.

Additional management reviews have been performed which were not specified in the original plan:

The effectiveness of the six local sediment and erosion control programs has been evaluated by visiting construction sites and rating the management practices installed.

Public Participation

Aided by Linda Haghighat, Howard County 208 staff, Columbia Association members and local residents prepare to play an active role in sampling for the Columbia Lakes Study.

The main opportunity for public participation in the development of the Baltimore Region's 208 Plan was through membership in Public Advisory Committees. The regional 208 Public Advisory Committee has been meeting since January of 1976. It was designed to have forty-three members representing environmental interests, business and industry, neighborhood groups, agriculture, public education or research, planning advisory boards, and the advisory committees for each of the seven river basins in the region.

In developing a plan for public participation, the 208 Public Advisory Committee realized the need for local committees in each of the six jurisdictions. Successfully developed in most of the jurisdictions, these local groups paid close attention to water quality issues which planners may have omitted. Each month, the local representatives brought their concerns to the regional 208 Public Advisory Committee meetings, where they combined their experiences to evaluate the Plan from a regional perspective. The local and regional Public Advisory Committees provided direct comments to the technical staff about the work program, water quality sampling locations, and reports and studies which were part of the Plan. The regional 208 Public Advisory Committee also made recommendations to the Coordinating Committee which manages the 208 Program.

In addition to providing an opportunity for citizen consultation, regional and local Public Advisory Committee meetings have served as an on-going citizen forum on clean water. There have been speakers on such topics as sediment and erosion control, agricultural pollution, stormwater management, and water quality standards. The regional committee co-sponsored a citizen's forum on water quality with the Maryland Wildlife Federation. To learn more about the pollution problems of the Chesapeake Bay, the regional committee invited five scientists to hold a panel discussion at a monthly meeting. Through the 208 Public Advisory Committee's mini-grant program, sixteen organizations each received $208 to inform the public about water quality issues. With the aid of the local Public Advisory Committees, the regional committee distributed 5,000 copies of a water pollution attitude survey to the public.

As implementation of the 208 Plan continues, there will be even greater need for public involvement and support. Citizens are the taxpayers whose funds are used in pollution control. They also contribute to water pollution and must be enlisted in efforts to establish pollution control programs if those programs are to succeed.

WHAT CITIZENS CAN DO

Here are some ways in which concerned citizens can contribute to the campaign against water pollution:

1. You as an individual are responsible for water quality, too. The way that you manage your property and your pet's waste, your use of insecticides and fertilizers, whether you sweep trash into streets and storm drains, and where you dispose of used motor oil all have effects on nearby streams. Contact your local water quality management office for more information. The telephone numbers are listed on the inside back cover.
2. Become familiar with the existing pollution control programs operated by state and local government agencies. Be observant and report suspected pollution problems to the appropriate agencies. To find out about state and local programs, contact your local water quality management office.
3. Support your local and state pollution control programs, and don't hesitate to offer constructive criticism when you think they're not doing their job. You can make yourself aware of the water quality issues in your area by calling your local water quality office.
4. Most jurisdictions in the region have a local 208 Public Advisory Committee, which is composed of citizens like you. The committee addresses local programs, projects and activities concerning water quality. Your participation is needed. To get involved, contact your local water quality management office.
5. Each local committee sends a representative to the regional 208 Public Advisory Committee. This committee discusses issues on water quality from a regional standpoint. It provides citizen viewpoints to the 208 Areawide Water Quality Management Program for the Baltimore Region by monitoring plan updates and revisions, as well as on-going work and new programs.

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For further information:
Copies of the *Water Quality Management Plan for the Baltimore Metropolitan Region*, the basis of this summary, will be available in public libraries and college libraries through the Baltimore Region. They are also available at the Water Quality Offices.

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